INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500043

AERONAUTICAL ENGINEERING

TUTORIAL QUESTIONBANK

Course Title	MACHINE LEARNING APPLICATIONS			
Course Code	AAE801			
Programme	B.Tech			
Semester	VI			
Course Type	Elective			
Regulation	IARE - R16			
Course Structure	Lectures	Tutorials	Practicals	Credits
	-	-	-	-
Course Coordinator	Mr. Sudhir Sastry, Professor, Aeronautical Engineering			
Course Faculty	Mr. Sudhir Sastry, Professor, Aeronautical Engineering			

OBJECTIVES

The course covers the concepts of machine learning, construction of decision trees, linear discriminants, basic statics, graph models, genetic algorithms principle component analysis and basic clustering techniques This course helps the students in gaining the knowledge about the evolutionary learning, mathematical and engineering problems. This course helps to undertake future courses that assume this course as a background in deep learning and data science.

S. No	Questions	Blooms Taxonomy Level	Course Learning Outcome
	UNIT – I **TYPES OF MACHINE LEARNING** **PART – A (SHORT ANSWER QUESTIONS)**		
1	Define machine learning	Remember	AEC801.1
2	Describe the task involved in robot driving learning problem	Remember	AEC801.1
3	Describe the performance measure of robot driving learning problem	Remember	AEC801.1
4	Describe the training experience involved in robot driving learning problem	Understand	AEC801.1
5	Describe the task involved in a checkers learning problem	Remember	AEC801.2
6	Describe the performance measure of checkers learning problem	Understand	AEC801.3
7	Describe the training experience involved in checkers learning problem	Understand	AEC801.3
8	Define entropy	Remember	AEC801.3
9	Define information gain	Remember	AEC801.3
10	Define hypotheses in learning	Understand	AEC801.3
11	Define version spaces	Remember	AEC801.3
	PART – B (LONG ANSWER QUESTIONS)		
1	Explain in detail about different steps in designing learning problem.	Understand	AEC801.1
2	Write briefly various issues in machine learning.	Remember	AEC801.2
3	What is Decision tree? Explain the importance and use of Decision tree .	Remember	AEC801.3
4	What is information gain? Write in detail the expression for information gain.	Understand	AEC801.3
5	Discuss briefly about inductive bias and also explain briefly the decision tree learning.	Remember	AEC801.3

6	What is restriction biases? Explain in detail about restriction biases?	Remember	AEC801.2
7	What is preference biases? Discuss briefly about preference biases examples if any.	Understand	AEC801.2
8	Explain in detail about various issues in decision tree learning.	Remember	AEC801.2
9	Give a decision trees to represent the A ∩ -B	Understand	AEC801.3
10	Describe the relationship between the learned decision tree and version spaces.	Understand	AEC801.3
11	Describe about "Decision Trees as Classifiers". Take any eight training examples describe by three symbolic attributes and classify as positive and negative examples of a given class.	Understand	AEC801.3
12	What are Rules? Explain in detail how to convert the Decision tree into Rules.	Understand	AEC801.3
UNIT-II LINEAR DISCRIMINANTS			
PART – A (SHORT ANSWER QUESTIONS)			
1	What is perceptron?	Understand	AEC801.4
2	Define linearly separable sets.	Remember	AEC801.4
3	State the primitives represented by a perceptron	Understand	AEC801.4
4	What is back propagation?	Remember	AEC801.4
5	Write a short note on forward propagation	Understand	AEC801.4
6	Define Gamma	Understand	AEC801.5
7	Describe Margin	Remember	AEC801.5
8	What is linear kernel?	Remember	AEC801.5
9	What are tuning parameters in support vector machines?	Remember	AEC801.4
10	Write a short note on classification.	Understand	AEC801.4
PART – B (LONG ANSWER QUESTIONS)			
1	What is perception? With a neat digram draw and explain about a perceptron.	Remember	AEC801.4
2	Explain in detail about different perceptron training rules.	Understand	AEC801.5
3	What is sigmoid threshold unit? Draw and explain a sigmoid threshold unit	Evaluate	AEC801.4
4	Explain in detail about back propagation algorithm.	Remember	AEC801.5
5	What is back propagation algorithm? Describe different remarks in back propagation algorithm.	Understand	AEC801.6
6	Write in detail about feedforward network and its importance.	Remember	AEC801.6
7	What is kernel? Explain in detail about kernel and its usages.	Understand	AEC801.6
8	What is regularization parameter? Discuss briefly about the importance of regularization parameter.	Remember	AEC801.5
9	Descirbe in detail about good margin?	Remember	AEC801.6
10	Explain in detail about the term "State kernel trick".	Remember	AEC801.6
UNIT-III BASIC STATISTICS			
PART – A (SHORT ANSWER QUESTIONS)			
1	Write a short note on Average?	Remember	AEC801.7
2	Define Variance	Remember	AEC801.7
3	What is Co-variance?	Understand	AEC801.7
4	Define a classifier	Remember	AEC801.8
5	Explain about random variable.	Understand	AEC801.8
6	With a neat diagram explain about Bayesian network	Remember	AEC801.7
7	Define conditional probability	Understand	AEC801.9
8	Describe inference of a model	Understand	AEC801.7
9	What are factor graphs?	Remember	AEC801.7
10	What are Bayesian networks?	Understand	AEC801.8

PART – B (LONG ANSWER QUESTIONS)			
1	Discuss in detil about average and variance with an suitable examples.	Remember	AEC801.7
2	State Bayes theorem with an example if any.	Understand	AEC801.8
3	What are the characteristics of a naïve bayes classifier?	Understand	AEC801.9
4	Define optimal classifier	Remember	AEC801.7
5	What are Bayesian networks? Explain in detail about Bayesian networks.	Remember	AEC801.7
6	What is MAP hypothesis? Discuss briefly about MAP hypothesis.	Understand	AEC801.8
7	Write an algorithm to build to build minimal I-map	Remember	AEC801.8
8	What is exact inrerence? Compare the difference between exact inference and approximate inference	Understand	AEC801.9
9	Draw and explain a simple Bayesian Network for genetic inheritance	Analyze	AEC801.8
10	What is approximate inference ? Discuss in detail about approximate inference with an examples.	Understand	AEC801.8
UNIT – IV EVOLUTIONARY LEARNING			
PART – A (SHORT ANSWER QUESTIONS)			
1	Define fitness function	Remember	AEC801.10
2	Write a short note on offspring.	Remember	AEC801.10
3	What is meant by truncation selection?	Remember	AEC801.10
4	Describe fitness proportional selection	Understand	AEC801.11
5	Write a short note on crossover.	Remember	AEC801.11
6	What are different form of crossover?	Understand	AEC801.12
7	Define Ensemble learning	Understand	AEC801.12
8	Describe genetic programming	Remember	AEC801.12
9	What is meant by estimation distribution algorithm	Understand	AEC801.12
10	What is meant by dimensionality reduction	Remember	AEC801.12
PART – B (LONG ANSWER QUESTIONS)			
1	Describe the parameters used in Genetic algorithm	Understand	AEC801.12
2	What is mutate? Explain in detail about mutate.	Remember	AEC801.10
3	Write the expression for probability of hypothesis	Remember	AEC801.12
4	Describe in detail about hypothesis representation	Understand	AEC801.11
5	What are Genetic operators? Explain in detail about its uses.	Understand	AEC801.11
6	Discuss tree based Genetic programming	Remember	AEC801.10
7	What are the different types of Genetic programming?	Remember	AEC801.10
8	Describe the selection of a model in ensemble learning	Understand	AEC801.11
9	Define data fusion and confidence estimation	Understand	AEC801.12
10	Why dimension reduction is essential in machine learning and predictive modeling	Remember	AEC801.12
UNIT-V CLUSTERING			
PART – A (SHORT ANSWER QUESTIONS)			
1	What is Clustering?	Understand	AEC801.14
2	What are different types of Clustering?	Remember	AEC801.14
3	Write a short note on similarity.	Understand	AEC801.13
4	What are different types of similarity measure?	Understand	AEC801.13
5	Describe outliers in data	Understand	AEC801.13
6	What are hierarchical methods of clustering	Understand	AEC801.14
7	Define K-means clustering	Remember	AEC801.13
8	Describe the purpose of clustering with categorical attributes	Remember	AEC801.14
9	What are the various strategies for grouping of variables	Understand	AEC801.13
10	Define ClustOfVar	Understand	AEC801.13

PART – B (LONG ANSWER QUESTIONS)			
1	Describe similarity and distance measures	Remember	AEC801.14
2	What are K-means and hierarchical clustering techniques?	Understand	AEC801.14
3	What are partitional algorithms? Explain in detail about partitional algorithms.	Remember	AEC801.13
4	What is Clustering? State and explain detail about the applications of clustering	Remember	AEC801.15
5	What are agglomerative algorithms? Discuss briefly about agglomerative algithms with an examples.	Understand	AEC801.13
6	What are divisive algorithms for clustering?	Understand	AEC801.15
7	Discuss briefly abot hierarchical clustering? And also describe the applications of hierarchical clustering.	Understand	AEC801.15
8	What are the drawbacks of outliers in clustering?	Understand	AEC801.15
9	Explain in detail about different objectives of clustering of variables?	Understand	AEC801.15
10	What is Dice's coefficient? Describe in detail about Dice's coefficient with an examples.	Remember	AEC801.14

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